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Apartment Building Pre-Incident Planning for the Midwest City Fire Department

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Certification Statement

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Abstract

The problem is the Midwest City Fire Department does not have a pre-incident planning program for apartment buildings thus placing citizens and firefighters at greater risk. The purpose of this action research is to develop a pre-incident planning program proposal for apartment buildings through literature review and a survey. The research was based on the components of a pre-incident planning program, information to be gathered for apartment buildings, information that should be available during response, and recommended methods of depicting critical information.

It was determined pre-incident planning is a well-embraced function of the fire service that lacks formality and standardization. It was found that apartment buildings present critical life safety hazards that deem a formal pre-incident planning program. It was recommended that building information be simple, clear, and easy to find during response to an emergency. Critical information to be gathered during the data collection process as well as the information needed during response was determined. It was also found that pre-incident plans are best depicted through on-board computers and paper formats in three-ring binders. Training, post-incident analysis, and annual updates were determined to be critical components of the program.

As a result of the research, a proposal was developed that included an Apartment Building Pre-Incident Planning Standard Operating Procedure. The proposal recommends the evaluation and purchase of a computer program, developing standard forms, and increasing the utilization of on-board computers to display important building premise. The program involves all levels of the organization in collecting information, generating plans, storing, and coordinating updates and new buildings. An important function of the program is the use of pre-

incident plans for training and post-incident analysis. The program will achieve an increased level of safety for firefighters as well as the citizens of Midwest City.

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Introduction

Fire officers across the United State make critical decisions every day within stressful situations and under narrow time constraints. These decisions are usually made with limited or incomplete information placing the safety of firefighting teams and citizens at stake. Fire departments across the country are providing the best possible services with the limited resources available and strive to achieve the commitments found within the organization's mission statements. The Midwest City Fire Department (MWCFD) strives to provide the best possible services through a multitude of programs and promotes the mission statement below:

> "The MWCFD is charged with the responsibility of reducing risks to lives, property, and the environment from man-made and natural disasters, to the lowest extent possible through the effective use of all resources made available. This responsibility is achieved by responding to and mitigating emergency incidents, preparing for emergency situations that may be anticipated to occur, reducing the risk within our jurisdiction by preventative measures against the outbreak of fires and other emergencies, limiting the extent and severity of such emergencies through risk reduction and built-in control measures, providing for the treatment, removal and rescue of injured and/or endangered persons, and to control emergencies that occur" (Midwest City Fire Department Website, 2008).

Although the mission statement is typical to most other fire service organizations, the statement offers preparedness as a core value. The MWCFD continually enhances emergency preparedness; the problem is the MWCFD does not have a pre-incident planning program for apartment buildings thus placing citizens and firefighters at greater risk. The purpose of this research is to propose a pre-incident planning program for apartment buildings for the MWCFD.

This research reveals the fire services' best practices of pre-incident planning for apartment buildings, thus creating a valuable resource for officers responding to and managing emergencies at apartment buildings. Research is based on the following research questions: (a) What are the components of a pre-incident planning program, (b) What information should be obtained when conducting an apartment pre-incident survey, (c) What information should be available to crews while responding to an apartment complex fire, and (d) What is the recommended method of depicting important information on a form that is used during emergency response?

The research questions were answered through action research methodology with an apartment building pre-incident planning proposal as a final product. The primary method of data collection for the research regarding an apartment building pre-incident planning was through the use of a survey and literature review.

Background and Significance

The MWCFD provides fire and rescue services through 5 stations with 2 ladder companies, 2 rescue squads, 3 engine companies, and 1 command unit. The MWCFD consists of 89 suppression employees, 5 fire prevention bureau employees, and 3 administrative employees. In 2005, the City of Midwest City and the MWCFD were graded by the Insurance Services Office – Public Protection Classification (ISO-PPC) and was awarded a classification of 1. The population of Midwest City is about 56,000 residents within a 25 square mile suburban setting just east of Oklahoma City. Midwest City is primarily a residential community with retail, hotels, restaurants, and businesses.

The average response time for first arriving MWCFD units to building structure fires between January 1, 2008 and December 31, 2008 was 4 minutes and 43 seconds. (D. Richardson, personal communication, October 30, 2009) The United States Department of

Homeland Security (2006, p. 5) cites "Nationally, average response times were generally less than 8 minutes and the overall 90th percentile, a level often cited in the industry, was less than 11 minutes".

According to the United States Census Bureau (2009), there are 22,960 occupied housing units in Midwest City and an estimated 19.7% of the occupied housing units are apartment buildings. Midwest City has 30 apartment buildings with an estimated 9,000 living units. In a five year time frame; September 1, 2004 – September 1, 2009, there have been 101 structure fires at apartment buildings with an estimated $1,514,975 dollars of property damage. During the same time frame, MWCFD responded to 28,350 emergency incidents, of which 1,780 were building fires. Therefore; 17.6% of building fires have occurred at apartment complexes.

According to the United States Census Bureau (2009), there is an estimated 126,237,884 total housing units with an average of 111,609,629 occupied housing units in the United States. Of the total housing units, 32,821,849 or 26% are defined as multi-unit structures. Furthermore, 76.9% of the multi-unit structures were built between 1950 and 1989. In the United States Census Bureau's (2008) the median age of an apartment renter was 39 years old, 49% of renter households were single, and 22% had at least one child in the household. Furthermore, 38% of apartment households had an income of less than $20,000 and the median income was $25,500.

The National Fire Protection Association (NFPA) reports that public fire departments responded to 1,451,500 fires in the United States in 2008. Structure fires accounted for 515,000 of the total fires and 403,000 (78.2%) were residential fires. During the same time frame 95,500 of the residential fires occurred in apartment buildings, which accounted for 18.5% of all structure fires. Furthermore; in 2008, there were 3,320 civilian fire deaths of which 2,780 civilians died in residential fires and 390 died in apartment building fires. In addition, there was

an estimated 16,705 civilian fire injuries in 2008, of which 13,560 were injured in residential properties and 3,975 occurred in apartment buildings. In 2008, property loss in structures totaled $8,550,000,000 while $6,892,000,000 occurred in one and two family residential properties and additional $1,352,000,000 occurred in apartment buildings. (Karter, 2009)

The MWCFD constantly strives to efficiently and effectively utilize all available resources to maintain a constant state of preparedness. During the 1980's, Midwest City experienced rapid growth and an increased construction of apartment buildings, the fire department embarked on an aggressive pre-incident planning program that included target businesses, schools, churches, mobile home parks, and apartment buildings. Structures were assigned to response crews who would conduct a pre-incident survey that included a plot plan. Information obtained from the pre-incident survey was hand-drawn and forwarded to the Fire Prevention Bureau, who would forward them to all response crews and were maintained in three-ring binders in each apparatus. The content and illustration of the form was generally at the discretion of the company officer.

This program slowly disappeared and a large number of the original maps drawn in the 1980's are still in place. In early 2000, an effort was put in place to reinvent the pre-incident survey program, however, the effort mixed basic fire inspections with property surveys and quickly was terminated. Sunday mornings have always been designated as pre-plan days and has traditionally been the days companies surveyed the businesses, schools, churches, mobile home parks, and apartment buildings and updated pre-incident plans. However, this effort is primarily at the discretion of the shift commander and company officers.

Recently, a reemphasis of the property surveys and pre-incident plans has surfaced and in July 30, 2008, the City's GIS department distributed aerial maps of target business, schools, and

apartment complexes with an overlay of graphics representing streets, building numbers, and hydrant locations. These maps were haphazardly placed in the pre-plan three ring binders of the apparatus and the older versions were not removed. Furthermore, emergency response crews had hand-drawn notes on the original maps, which are not consistently shared with other crews or transposed on the newer maps.

All MWCFD apparatus have on-board computers with the capability of storing building information and building survey information that is referred to as premise information. Only critical data of a limited number of structures has been entered into the database. The use of on-board computers for retrieving pre-incident information is not commonly used by MWCFD officers while responding to structure fires.

Many officers have maintained their personal pre-fire and map books. During their pre-fire planning, notes are placed within their own books and those assigned to apparatus have been seriously neglected. When responding to or working in another district, officers are more familiar with their personal books than those assigned on the apparatus.

As previously mentioned, the problem is MWCFD lacks an apartment building pre-incident planning program; including policies, standard operating procedures, forms, or training that would enable an effective and sustainable program. The MWCFD has seen an increase of younger and less experienced personnel being promoted to officers and the need for effective pre-incident plans and the experience of the planning process has never been more critical.

Although a pre-incident planning program should include all target hazards, apartment buildings present frequent emergencies, large life loss potential, and building construction hazards. In the proposition of a standard operating procedure or pre-incident planning program,

officers will be more informed in making critical and rapid decisions and citizens will be better served by a more prepared and competent fire service.

This applied research paper is supported by the United State Fire Administration (USFA) Executive Analysis of Community Risk Reduction course by assessing community risk as presented in Chapter 3. Furthermore, the research follows the community risk-reduction model as presented in the course (United States Department of Homeland Security, 2008). This research is directly linked the USFA operational objective of promoting a comprehensive, multi-hazard risk-reduction within the community, reducing the loss of life of fire fighters by 25 percent, and appropriately responding in a timely manner to emergent issues (United States Fire Administration, 2007).

Literature Review

"The increasing demand for adequate, low-cost, functional and aesthetically pleasing housing has led to an increasing demand for adequate, safe, and economical fire protection" (Bush, 2008, p 20-47). According to Bush, this has created a unique fire problem and is compounded by the need for higher and larger buildings with an increased number of occupants. Brannigan and Corbert (2008, p 258) recommend "The knowledge the fire department gains from the day an apartment development is planned should be disseminated and become the organized property of the fire department. A system should be in place to make the information available to the IC at the fire scene. This information and the ability to make effective plans provides for increased safety for all concerned."

"Pre-incident planning provides a way to protect firefighters and better serve the community. These plans should include information important to the incident commander and should be current, correct, and accessible at the emergency scene (Klaene & Sanders, p. 21).

NFPA defines a pre-incident plan as "a document developed by gathering general and detailed data to be used by responding personnel to determine the resources and actions necessary to mitigate anticipated emergencies at a specific facility" (NFPA, 2003, p 6). Pre-incident planning; is therefore, a process of gathering data and developing a plan. Furthermore, NFPA 1620, Recommended Practice for Pre-Incident Planning outlines a pre-incident planning process focusing on the development, use, and maintenance of a pre-incident plan, which becomes the foundation for decision-making during an emergency. Additionally, the pre-incident plan provides important data that will assist an incident commander in developing appropriate strategies and tactics for managing an incident. To understand pre-incident planning for apartment buildings, it is critical to understand the components of a pre-incident planning program, what information should be obtained during the apartment building pre-planning process, what building information is critical during an emergency response, and how critical information is best depicted and accessed.

Components of the Pre-Incident Planning Process

It is within the process of developing a plan that an organization or group enhances preparedness. Lindell and Perry (2003) state "there is a tendency to equate emergency planning with the presence of a written plan and similarly believe that a written plan is evidence of jurisdictional preparedness." In response to this tendency, they presented ten guidelines for an effective planning process aimed at clarifying the relationship among the three critical components of community emergency preparedness; planning, training, and the written plan. Although directed towards the principles of emergency management, these guidelines establish a practical foundation enabling preparedness, regardless of incident size or scope. These principles include:

1. Planning should be based on the accurate knowledge of risk.
2. Provide adequate knowledge to encourage appropriate actions.
3. Focus on principles rather than specifics.
4. Address interagency coordination
5. Include multi-hazard management
6. Include a training component
7. Address testing and evaluation
8. Should be a continual process
9. Plan for conflict and resistance
10. Implementation during an emergency is its true test

The first guideline for effective emergency planning recommends the process be based on an accurate knowledge of risk in conjunction with an organization's ability to safety and effectively manage an emergency. Emergency response personnel and fire ground commanders should be responsible for determining information to be included in a pre-incident plan, which drives the action plan of the emergency incident (Norman, 2008, p. 12-302). Klaene and Sanders (2000, p.20) warn that although it is tempting to simply copy drawings from those provided by building owners, they often include unimportant details lacks emergency considerations.

The second principle states that effective planning should provide adequate information that encourages appropriate actions of emergency managers. Klaene and Sanders (2008, p. 98) contend that "plans should be current, correct, and accessible." Similarly to the first principle, Nilson and Erikson (2000, p.9) promote the leadership of the central position responsible for pre-incident planning is essential in ensuring that plans are accurate and useable.

The third guideline promotes that all emergencies create dynamic changing environments and it is impossible to cover every event, therefore; the planning process should focus on principles rather than specific tactics. Klaene and Sanders (2008, p. 98) agree that pre-incident planning should not "establish pre-assigned tactics or direct company operations", rather it should identify important building features and known hazards facilitating enhanced decision-making by fire ground commanders. Brannigan and Corbett (2008, p.6) warn that the word plan might be misused when describing pre-fire planning as it sometimes leads to an over-emphasis on the planning of specific actions. He contends a more accurate term may be pre-fire analysis.

The fourth emergency planning guideline addresses the importance of inter-organizational coordination during all phases of emergency planning. This is also relevant and applicable to pre-incident planning apartment complexes and is substantiated by the NFPA 1620, which recommends including apartment managers and maintenance personnel (2003, p.7).

The planning process, as stated in the fifth principle, should address a comprehensive approach for multi-hazard preparedness. Norman (2008, p. 301) states that "pre-incident planning is not just for structural fire fighting and an all-hazards approach is as applicable to pre-incident planning as it is to other aspects of emergency services operations". This is also substantiated by Brown et. al. (2002 p. 348) after a study of the locations of injured survivors and those who died following devastating tornadoes that struck central Oklahoma in 1999. They found the proportion of deaths was significantly higher in mobile homes, apartments, and outdoors.

The sixth disaster planning guideline rest on the idea that plans should have a training component. Nilson and Erikson (2008, p.135) found that when those who are responsible and conducting planning should be considered teachers, stewards, or brokers of the process and

preparedness. This will enhance buy-in and commitment to the planning process and create a more usable and applicable plan. According to Serapiglia (2008, p. 12-289) “proper training is also critical to the pre-incident planning success and conducting the survey requires much more than walking through the building.”

Jederberg (2005) conducted a study and reviewed issues and sources of information available to people responsible for emergency planning and response. He concluded the “interpretation of the data and application in a variety of scenarios will help ensure that in a real incident, the strengths and weaknesses can be understood and incorporated in decision making”. This research directly supports Lindell and Perry’s seventh guideline of an effective planning process, which states it should provide for the testing of the plan”. Serapiglia (2008, p.294) claims that “testing and practicing the pre-incident plan will provide an opportunity to fine-tune the data and to revise and update the plan.”

The eighth principle of effective emergency planning claims effective planning process is not static and one of the most important attributes of emergency planning requires a continual process. Serapiglia (2008, p. 290) agrees by stating, “Pre-incident planning is a continuous process and keeping up with changes in a facility requires a high level of commitment, communication, and cooperation”.

The ninth principle contends that emergency planning is always conducted in the face of conflict and resistance. Serapiglia (2008, p. 289) agrees by stating “it takes considerable effort by the fire department to get a pre-incident program up and running. As growing demand for an expanding scope of service collides with limited budgets and other resources, fire departments are faced with much competition for staff time and money”. To decrease the exposure and influence of conflict and resistance, Crane (2005, p. 89) conducted a managerial leadership study

and concluded the five steps that the most effective leaders generally follow tell people what is expected of them and ensure they know how to complete their task. Furthermore, Crane recommends granting adequate time for personnel to complete their task and stressing to personnel how important their input is and concludes with the value of providing people with timely feedback.

The tenth guideline states that planning and management are different functions and the true test of a plan rest with its implementation during an emergency. Serapiglia (2008, p. 294) claims that during the incident, the pre-incident plan becomes the foundation for operations and each incident provides an opportunity for improvement. Assumptions, predictions, and accuracy of the pre-incident plan should be evaluated in light the actual results during the incident. Furthermore, the Federal Emergency Management Agency (2008, p. 1) published a technical document in regards to the importance of an after-action process. It reinforces the number of fires in the United States that are responded by the fire service continues to decline, even as the population increases. This leads to fewer fires and leads to less actual firefighting experience for firefighters, and sometimes reduction in the number of uniformed personnel in the fire department. The post-incident critique is one method to bridge the experience gap by conducting routine after-action reviews. The fire department can use the lessons learned to improve plans and procedures and provide a culture that fosters preparedness.

NFPA 1620 organizes the pre-incident planning process into three phases; before the incident, during the incident, and after the incident. The planning process begins before the incident occurs and activities include collecting and organizing data followed by the preparation of the plan. Once the plan is completed, it is then distributed, reviewed and becomes topics of training.

Norman (2008, p. 302) recommends a pre-incident planning program begins by determining the priorities and then deciding what data is needed. There should be a standardized method of collecting required data and collectors are trained. Site visits are scheduled and data is collected followed by the development of strategic and tactic plans using a standardized format. Copies are distributed to all potential users with accompanied training on the objectives of the pre-incident plans. The plan is reviewed and updated periodically, is revised, redistributed, and retained.

NFPA 1620 recommends when evaluating target occupancies to pre-plan, strong consideration should be given to life safety, structure size and complexity, and a variety of other hazards (2003, p. 7). "There is probably no class of building in which good fire planning and training can pay off more than in garden apartments" (Brannigan & Corbett, 2008, p. 258). Fires in apartment buildings present the potential for a high proportion of fire victims that could potentially suffer crushing financial blows.

NFPA defines an apartment building as, "a building or portion thereof containing three or more dwelling units with independent cooking and bathroom facilities" (NFPA, 2003, p 5). Bush (2008, p. 37) further defines these structures as apartment houses, tenements, condominiums, or garden apartments. Additionally Bush (2008, p. 38) characterizes apartment housing units as compact, economical, and requiring less individual maintenance; therefore, the design, construction, and occupancy of multi-unit buildings have become a popular issue and occupancy hazards include typical risk factors that may arise in particular segments of the populations.

Wu (N.D., p. 4) presented eight primary elements of a fire safety strategy recommended for a safer environment for tenants of apartment buildings. The primary elements, which are all

interconnected, include; the emergency plan, building and egress characteristics, occupant characteristics, fire, fire safety systems, training and education, and fire brigade intervention. The research evaluated the impact these have on the fire safety design of apartment buildings and studied the combination of several fire safety issues that make apartment buildings unique compared to other buildings. Some of the main issues are sleeping occupants, numerous ignition sources, high fuel loads, demographic and cultural diversity, protection of escaping occupants, and high populations.

Stowell (2004, p. 398-400) explains the relationship of planning and execution and application of incident objectives. Officers must use the knowledge of strategy and tactics to develop emergency response plans. "A strategy drives the development of the overall plan for controlling an incident or situation and describes how, in general terms, how the operation will be conducted. A tactic (or tactical objective) is an action that is taken to achieve the chosen strategy". Incident objectives and the planning process should be dictated by life safety, incident stabilization, and property conservation. Therefore; pre-incident planning should be based on prioritized strategic and tactical objectives, an examination of Chief Lloyd Laymen's decision-making model is called for. In 1940, he introduced a generally accepted model referred to as the acronym RECEO-VS that served as a priority-based decision making model for incident commanders to apply at an emergency incident. This model includes the following strategic considerations and provides valuable insight the pre-incident planning components:

1. Rescue
2. Exposure
3. Confinement
4. Extinguishment

5. Overhaul
6. Ventilation
7. Salvage

In addition to Layman's recommendation of incident priority, Norman (2008, p.12-303) offers the following acronym that is recommended for size-up information at an emergency incident. This allows provides insight into the needs of a pre-incident plan that would be useful and practical to fire officers. The recommended acronym is COAL WAS WEALTH and is defined as:

1. Coal
2. Occupancy
3. Apparatus and Staffing
4. Life Hazard
5. Water Supply
6. Auxiliary Appliances
7. Street Conditions/Special Matters
8. Weather
9. Exposures
10. Area and Height
11. Location and Extent of Fire
12. Time
13. Hazardous Materials

Information to be Obtained During Pre-Incident Surveys

Norman (2008, p. 301) recommends "once the outline of the desired information is determined, a standard format must be developed to capture the information and process it for future use". NFPA 1620 and Serapiglia (2008, p.294) both recommend that height (number of stories) and square footage be collected as the size of the building can have a drastic effect on the decision process that takes place during an emergency. In addition, wall and roof construction should be evaluated and recorded, especially fire walls. Brannigan and Corbett (2008, p.256) states that firewalls are often used to separate units in multifamily residential structures. Ideally, masonry firewalls should be able to the extension of the fire without assistance from the fire department. In a alert from the National Institute of Occupational Safety and Health (NIOSH) (2005, p. 8) it is recommended that fire departments, firefighters, building owners, and managers take steps to minimize the risk of injury and death to firefighters during fire fighting operations involving structures with truss roof and floor systems by ensuring that fire fighters are trained to identify different types of roof and floor truss systems and the hazards associated with each. More specifically, NIOSH calls for conducting pre-incident planning and inspections to identify structures that contain truss construction.

Both Serapiglia (2008, p. 297) and NFPA (2003) recommends collecting, recording, and updating emergency contact information of facility staff. The locations of utilities controls are critical for emergency responders to identify according to Serapiglia (2008, p.297). This includes electrical power disconnects, water shutoffs, and gas metering shutoffs. Brannigan and Corbett (2008, p.254) states that gas service can provide special hazards in these structures and should be studied and identified. NFPA further recommends identifying and recording any considerations with emergency power generators.

Access considerations, such as narrow rights of ways, low-overhead clearances should be noted and considered. Furthermore, Serapiglia (2008, p. 297) recommends familiarity with local streets and roads on the area that provides the best access route to the location. This consideration includes the location of fences, gates, and lock-boxes. It is also recommended that any significant exposures be noted and considered.

NFPA 1620 recommends that exterior stairway locations be identified and recorded on within the plan. An important consideration is the occupant load and means of egress. According the Serapiglia (2008, p. 295) the density of occupants of apartment buildings make the means of egress a critical consideration. The location of a building's entrances and exits and stairs can be extremely valuable information in developing strategy or directing rescue or fire control. His recommendations also remind those collecting pre-incident data to evaluate and examine emergency action plans that may be distributed to tenants.

NFPA recommends an examination of fire alarm systems, calculation of the required fire flow, location and operation of the water supply system as well as the location of standpipes and fire department connections. Serapiglia (2008, p. 297) advises that pre-incident plans should note if available standpipe systems are wet or dry type with the size of the hose discharge outlet. He continues with recommending recording the location of sprinkler control valves, and the building areas they protect, must be determined during pre-incident planning. The location of the FDC should be also be determined and clearly noted. The connections should be identified as to whether they feed the entire site, individual buildings, individual systems, or standpipes. Concluding the data collection recommendations, emergency responders should note any special hazards as well the availability and location of master keys.

Pre-Incident Information that is Recommended during Emergency Response

NFPA 1620 (2003, p 13) recommended “the pre-incident plan should provide critical information that could be advantageous for responding personnel at the time of dispatch. (Wu, 2001) describes the fire brigade as the last line of attack on a fire, and usually the last opportunity to find and rescue occupants. For the fire brigade to perform their jobs properly, they require adequate site access, adequate water supplies, suitably located fire system control centers and indicator panels, and protection from structural failure for an appropriate length of time.

Bond & Cooper (2006) conducted a review and of the literature on recognition-primed decision (RPD) making and influences on emergency decisions with particular referenced to an ophthalmic critical incident. A total of 12 papers were included identifying the recognition-primed decision making as a good theoretical description of acute emergency decisions. In addition, cognitive resources, situational awareness, stress, team support, and task complexity were identified as influences on the decision process. This research used a case study of an ophthalmic anesthetic incident and separated nine different acts that were taken during an emergency beginning with notification of complication until patient’s condition improved. These acts were broke into three stages that lasted five minutes and described decision making characteristics during this time. Stage 1 is described as “identified and act” and is based on intelligence, experience, and technical expertise and occurs within one to two minutes. Stage 2 is described as “observes and acts” and added situational awareness to the cognitive resources listed above and occurred within two to three minutes. Finally, stage 3 is described as observes and maintains and lasts three to five minutes. The critical decisions made by an experienced ophthalmic nurse in the first five minutes of an anesthetic emergency created a successful outcome for the victim who returned to full and complete function within 90 minutes.

Furthermore, their review suggest that emergency decisions are dependent on rapid situational assessments and are not (and cannot be) related to the optimal decision-making strategies. Their conclusion was that recognition-primed decision-making describes the decision process of experts in time-bound emergency situations, which will ultimately enhance effectiveness. It is important to recognize that decision-making needs to be situational specific for exemplar outcomes.

National Fire Academy, Fire Protection Systems for Emergency Operations (3-21) discusses the Quick Access Prefire Plan, also known as (QAP), and is intended to provide a simple data collection form and display tool for emergency responders. It is arranged so that responding companies can perform a quick check of the building layout, fire protection features, hazards, and required fire flow. The first page of the QAP includes:

1. Plan Number
2. Address
3. Name
4. Response District
5. Emergency Contacts
6. Construction Type
7. Fire Protection Systems and Features
8. Water Supplies available
9. Water Supply Needed
10. Initial Dispatch
11. Special Resources
12. Exposures

13. Strategies

14. Comments

Page two of the QAP form is for a diagram of the building or complex layout. This page also lists the address, name, preplan number, and district. A typical diagram would show hydrant locations, main sizes, and access points; separation distances between buildings; locations of sprinkler/standpipe system connections; fire alarm control panel location; a brief construction description of bother the buildings and their roofs; building use; and size of each building.

Klaene & Sanders (2000, p 20) state "A formal pre-incident plan drawing, using intuitive symbols, should also be included to help firefighters find important building features." Norman (2008, p. 300) claims, "for pre-incident planning to be effective, it should address the information that fire-fighting personnel, particularly the incident commander, will need in order to develop their strategy for dealing with potential incidents". Most pre-incident planning focuses on aspects of the size-up that can be know beforehand and that are likely to remain static until an event occurs.

In the Fire Protection Systems for Emergency Operations student manual by the National Fire Protection Association (n.d.) present states that classical decision making requires time and is best when used in training, post-event evaluation, and pre-incident planning. It is used at a fire scene only if necessary knowledge and experience are lacking. However, the knowledge and experience acquired in pre-incident planning and training are keys to be able to make critical decisions.

A quality pre-incident planning process will greatly assist a fire officer in developing good objectives, strategies, and tactics. Using established pre-incident planning forms to

document important information on a particular target hazard lays the foundation for safer operations. It is critical that this information is capture and presented in a format that will be readily available to the IC; prior to and on arrival at an emergency.

Pre-incident planning takes on essentially two different forms. The first is the more formal process of using forms to gather data. The second is the walk through, reviewing documented pre-incident planning information and noting these changes. Proper pre-incident planning will greatly assist in adhering to these expectations and help avoid the liability that might arise if a department has difficulty with system components during a fire emergency.

Recommended Method of Depicting Important Information During Response

Norman (2008, 306) claims that "pre-incident planning is a multistep process that involves gathering information, analyzing that information, developing an action plan, and then making that plan available to those who need it during an emergency." NFPA 1620 (2003, p 12) recommends "a system for using the pre-incident plan should be designed that allows access to the plan itself or a summary of key elements of the plan while responding to and during the incident". Furthermore, "the pre-incident information should be presented so critical data is easily deciphered and understood under the emergency response conditions that could be encountered within a responding emergency vehicle's passenger compartment". Serapiglia (1620, p. 291) recommends the method of presentation is best left up to the discretion of each fire department, but it should be based on the fire department's incident management system.

Norman (2008, p.306) believes the simplest pre-incident plan involves written documents stored in three-ring binders kept on responding apparatus. Drawbacks include manually checking every address responding to and the size of the book. When properly used, a computer-

aided dispatching system is by far the most effective tool for recalling pre-incident information and such information should be recalled automatically when responding.

Serapiglia (2008, p. 291) states that "A number of commercially available software programs may be utilized to assist in recording the data and these programs are also useful in developing building drawings and a general layout of the facility".

NFPA 1620 recommend the pre-incident plan should provide critical information that could be advantageous for responding personnel at the time of dispatch. Serapiglia (2008, p. 295) states the "life safety considerations should be the first priority for pre-incident planning".

Fire service professionals need to embrace the importance of being as prepared as possible to deal with fires and other emergencies that may occur in an apartment building. This can be accomplished through a well-developed pre-incident planning process that helps develop and maintain current knowledge of the buildings and helps firefighters' better deal with these emergencies.

Procedures

A literature review was conducted at the Learning Resource Center at the National Fire Academy in Emmitsburg, Maryland. Additional literature review was conducted through on-line access to the Learning Resource Center at www.lrc.dhs.gov and through Kaplan University's Online Library. Efforts were made to locate current sources of research and information that focused on pre-incident planning, apartment buildings, program management, and emergency situation decision making.

A survey was developed and pilot tested by 25 members of the instructional staff at Eastern Oklahoma County Technology Center–Fire Training Center. Information obtained from Meier & Brudney (1997) was referenced for research design information. The survey was

developed and distributed through www.surveymonkey.com. A copy of the survey can be found in Appendix A.

The survey consisted of 18 questions with 4 focusing on background information, 8 relating to pre-incident planning program information, 2 referring to information obtained during pre-incident planning, 2 focusing information needed during emergency response, and 3 referencing the best practices for depicting information. The survey was designed to determine general information about pre-incident planning programs, information obtained during pre-incident surveys, recommended information needed during emergency response, and recommendations for depicting the information.

A link to the survey was sent to 310 fire service personnel throughout the country, on September 30, 2009. The data was collected and analyzed on October 22, 2009. To provide for a wide variety of responses, the survey was sent to an email list of current National Fire Academy – Executive Fire Officer Program students as well as to the Oklahoma State Fire Chief's Association email listing. Throughout the 23 days of the survey being available, 167 (N=167) surveys were collected representing a 54% return rate.

Limitations of the survey include possible misunderstandings of questions and terms. It was assumed the respondents were knowledgeable about pre-incident planning programs and apartment complexes. Another limitation includes any bias's respondents may possess about their departments pre-incident planning program. The lack of defining a clear sample population is considered another limitation. Furthermore, a similar and validated survey was not found during the literature review that could have been used to modify and compare results found in this research.

Results

The survey began by gathering background information from each respondent about the name of their fire department as well as the municipality, jurisdiction, and state of service. As previously stated, 167 respondents completed the survey from 147 different fire departments ranging across 43 states. The background information was obtained through open-ended questions in the narrative format. Appendix B contains the results of survey questions that focused on how many stations served their jurisdiction as well as the population. Of the 167 respondents, 128 or 76.6% reported having 1-10 fire stations within their jurisdiction (see Table B1) with110 or 65.8% serving populations of under 100,000 (see Table B2).

The first research question focused on the components of a pre-incident planning program and was answered through a review of specific documents about program implementation, program sustainability, and pre-incident planning. Furthermore, specific questions were designed in the survey and the results can be found in Appendix C. It was found that 95.8% of the respondents reported their departments conducted pre-incident planning (see Table C1) and 68.7% reporting that pre-incident planning is considered a formal department program as is shown in Table C2. Table C3 shows that 53.1% reported their department's pre-planning program included apartment buildings. Table C4 depicts the responses about how often pre-incident plans are updated and only 40.5% reported they are updated annually and most reported during new construction or at the discretion of the first due company officer. 78.3% of the respondents reported their department's plans were valuable during the response to an emergency at an apartment building (see Table C5). Table C6 shows that 67.9% of the respondents reported using pre-incident plans for training activities while Table C7 shows that 56.8% reported using pre-incident plans for post-incident analysis. An optional open-ended narrative question was included in this section of the survey that asked, "What recommendations

would you make to improve the effectiveness of your pre-incident plans specifically dealing with apartment buildings". Of the 167 total respondents, 102 provided a narrative response that can be categorized into the following recommendations: establish a formal program, needs up dated information, standard format, simple, easy to read, and accessible to on-board computers.

The second research question asked "What information is gathered when conducting an apartment pre-incident survey" and was answered through a literature review of apartment complex hazards and through two questions in the survey. Results of the survey can be found in Appendix D. The first question asked the respondents to indicate who is responsible, in their departments, for gathering pre-incident information at apartment buildings and the answers can be found in Table D1. It was determined that in 79.6% of the respondents reported that fire/EMS companies and 42.0% reported fire prevention officers were responsible for gathering pre-incident information at apartment complexes. Table D2 shows the results of what information should be gathered during the pre-incident planning process of apartment buildings. The top ten items the respondents indicated included; address, fire department connection location, water supply location, number of stories, emergency contact information, fire protection features, access restrictions, name of complex, building unit numbers, and knox-box locations.

The third research question involved determining what information should be available while responding to an apartment complex fire. This question was answered through a literature about critical information that is needed during an emergency. Furthermore, the included two questions to gain additional insight into these questions and the results can be found in Appendix E. Table E1 contains the results from the question, "In your department, who is responsible for maintaining, updating, and or reviewing apartment pre-incident plans". It was determined that 92.1% of the respondents reported that fire and EMS companies along with District/Chief

Officers are responsible for this task. Table E2 provides a complete list of the respondents recommendations of information that is most important for a company officer to access during the response phase of a fire involving an apartment building. The top ten items indicated include; water supply/hydrant location, fire department connection location, access restrictions, number of stories, fire protection features, utility shutoff locations, exposure concerns, building unit numbers, address, and knox-box locations.

The fourth research question involved determining the best practices of depicting important information during an emergency response. Appendix F contains the results of these questions. Table F1 includes the results to the question, "In your department, who is responsible for developing pre-incident plans". It was found that predominately, plans are developed by fire and EMS companies and/or district or chief officers. Table F2 includes recommendations for depicting important information. It was found that the use of mobile data computers and paper forms on a binder that contain a standard format that is computer generated is the most recommended method.

Discussion

Ioerger (n.d.) conducted a literature review of current research on teamwork with a focus on the aspects of human behavior in the domain of military combat. As in the fire service, teamwork is a central feature of military activities. Ioerger defines teams as groups of inter-dependent individuals working together to accomplish a common goal and found the most important component of an effective team is mutual awareness. This quality has been found to effectively enable a team to interact, anticipate each other's actions and needs and carry out required team process to achieve a common goal. Mutual awareness was also found to be the basis of more advanced team work activities such as distributed situational awareness and

command and control. Although this literature review was focused on the intense military activities in time-pressured and stressful military activities, fire service similarities can be easily drawn.

The purpose of this research is to develop a proposal for a pre-incident planning program for apartment buildings that will result in a tool that aids officers in making decisions while responding and upon arrival of fire emergencies. Officers are required to make critical decisions within an estimated 5 minute time-frame. Additionally, the MWCFD responds six companies, or teams, and the coordination of the command and control is critical to achieve the goals. Coordination is better facilitated if all responding units are viewing the same plan that is easy-to use, simple, complete, accurate, and current. Stowell (2004, p. 161) states that "making decisions can be difficult because of the personal barriers that exist within the individual". Furthermore, Stowell describes these barriers in terms of a lack of; data, accurate analysis, resources, support, commitment, and capacity. Research has shown that a well developed and sustainable pre-incident planning program will facilitate effective decisions and enhance teamwork.

The research has shown that the concept pre-incident planning is well defined by the National Fire Protection Association and very common throughout the surveyed departments. The literature reviewed all had similar descriptions of pre-incident planning. Jones & Bartlett (2006, p.215) explain, "the most essential reason for developing a pre-incident plan is to obtain information before an incident occurs that would be difficult to obtain during the incident". Furthermore; Jones & Bartlett (2006, p.219) claim, "pre-incident plans should provide critical information that could be advantageous for responding personnel, presented in a format that can be easily deciphered under emergency conditions". Pre-incident planning has been described as

critical, important, and essential, yet only 68.7% of the survey respondents defined their pre-incident planning in terms of a formal program. Whereas Stowell, (2004, p. 88) states, "programs are created to meet the organizations overall goal".

Out of 167 personnel that completed the survey for this research, 158 (95.8%) reported their department conducts pre-incident planning and 112 (68.7%) defined it as a formal program and only 86 (53.1%) claimed their program addressed apartment buildings. The survey used in this research utilized an optional and open-ended question of "what recommendations would they propose". 112 of the 167 respondents answered the question and a majority of responses involved instituting or making changes to a formal program. Stowell (2004, p. 288) cites "a tool that assist in both the planning and efficient management of the organization is project management, which is the process of planning, organizing, staffing, directing, and managing task and resources to accomplish a well-defined objective. Project management involved the application of knowledge, skills, tools, and techniques to a broad range of activities to meet the requirements of the particular program."

The survey results have shown support for developing an apartment building pre-incident planning program and the survey results contained insight into the needs of such a project. The NFPA recommends pre-incident plans be updated at least annually and this was supported by the research. The result of the survey question about updating pre-incident plans indicated that only 40.5% updated their plans annually, which also indicates a formal program could more effectively ensure plans are updated as recommended.

A majority of the literature review indicated a strong need for training as a component of the pre-incident planning program and 67.9% of the respondents reported they are currently using pre-incident plans for training activities. The literature review brought an unexpected

aspect of a pre-incident planning program. It was recommended that emergency response use the pre-incident planning process and the plan as a training component. It was also recommended to train personnel on the collection of information and the use of the plan during an emergency. Stowell (2004, p. 444), states "Training is the key to reducing all types of injuries and fatalities among fire and emergency services personnel." In addition to training, the post-incident analysis is a critical training component that can be supplement and enhanced by the use of a pre-incident plan and ensures that the plans are updated appropriately. The results of the survey found that only 56.8% reported using pre-incident plans for post-incident analysis.

An important consideration in developing a pre-incident planning program is assigning responsibility and accountability. The research survey included three separate questions about who is responsible for gathering information, developing the plan, and maintaining/reviewing the plan. More than 80% of the respondents included fire/EMS companies, district/chief officers, and fire prevention officers for the three functions. This supported the literature review in that those responsible for decision-making at an incident should be responsible for gathering, developing, and maintaining the pre-incident plans.

Two separate questions were included in the research survey that focused on what information that should be gathered during the pre-incident planning process and the information that should be available during the response phase of an apartment building. In the narrative portions of the survey, a majority of the respondents indicated a need for simple, short, and standard format be available during the response phase and can be found in Table E2. Additionally, the survey showed the respondents indicated more information to be included in the process of gathering the information, which can be found in Table D2 .

The final component of the research questionnaire focused on recommended methods of depicting important information that is used during emergency response. It was determined the recommended methods of depicting the information is through the use of mobile data computers along with standard paper size stored in three-ring binders and the information be computer generated rather than hand-drawn.

Schot & Geels (2008) discussed empirical and conceptual elaborations of the last 10 years in strategic niche management research. This approach suggests that sustainable innovation journeys can be facilitated by creating niches. The assumption was that if such niches were constructed appropriately, they would act as building blocks for broader changes towards sustainable development. This discussion has showed that concepts and ideas evolved over time. Niches and experiments are to be perceived as crucial for bringing about regime shifts. Through this research, it has been found that fire service personnel are supportive of formalizing pre-incident planning.

Recommendations

Based on the information gathered from the literature review and the results of the survey, it is recommended that a formal pre-incident planning program for apartment buildings be implemented into the MWCFD. It is recommended the program be introduced and coordinated through a standard operating procedure and responsibility be assigned the Fire Prevention Bureau for its coordination and maintenance. The information should be gathered by the 18 emergency response companies, with at least one apartment building assigned to each company and some will receive 2, depending on size and complexity of the buildings, until a total of 30 apartment buildings are assigned. It is recommended that computer drawing programs be evaluated and purchased for the drawing of plot plans. It is further recommended

that the premise information modules on the on-board computers are constructed to have data inserted and the ability to display critical information upon dispatch.

Based on the information from the survey, NFPA 1620, and the National Fire Academy's Quick Access Plan, a standard format be professionally developed that will guide personnel in collecting and utilizing the data. It is further recommended that the mobile data computers be modified to facilitate the inputting of premise information. Once the standardized format is developed and adopted, and the standard operating procedure approved, training should be conducted for each crew on the pre-incident planning process. It is recommended that 3 months be allowed for the crews to collect the data and complete the plan in consultation with their respective Assistant Chief/Shift Commander. Company officers should be instructed to contact the apartment building manager, explain the program, and ask for a representative to be assist with the process. The draft will be submitted to the Fire Prevention Bureau for review and approval. As the plans are completed, it is recommended that company is assigned a month where they are responsible in presenting their plan to their shift and reviewing the information on the plan.

It is recommended that one page be dedicated to critical information as detailed in the NFA Quick Access Plan and a additional page be dedicated to the plot plan. The two pages should be placed in the apparatus' pre-fire plan three-ring binder facing each other. This would allow an officer to open the book and have both pages available to review. Additionally, critical premise information is placed in on-board computer programs.

Once the training has been completed and pre-incident plans updated, the SOP becomes in effect, which requires that pre-incident plan be used in each post-incident analysis and updated and revised as needed. Furthermore, it is recommended the plans be re-assigned annually and

reviewed and updated. As the program becomes sustainable, it is recommended that other target hazards are evaluated and included within the pre-fire planning program.

These recommendations are supported by the literature review conducted and through the results of the survey. The program should be constantly evaluated and considered a dynamic process. This program will provide valuable experience for all personnel through the process of collecting information and planning. Additionally, it provides valuable information to officers responding to apartment building emergencies that will promote more effective decisions providing for a safer environment for firefighters and citizens.

This is an important topic and critical issue for all fire departments that deserves future research. It is recommended that pre-incident planning be divided into groups of target hazards, for example, apartment buildings, churches, industrial sites, business offices, etc. Each building function presents unique hazards that should be specifically evaluated and documented on a standard formation. This research has revealed other areas deserving additional research, including decision-making during response, educational programs for apartment building tenants, and building construction features of apartment buildings. Another opportunity for additional research that served as a limitation for this study is to further define pre-incident planning, pre-fire analysis, and building familiarity plans.

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Appendix A

Pre-Incident Planning for Apartment Buildings Survey

Introduction

I am conducting this survey as a project for the Executive Analysis of Community Risk Reduction class in the National Fire Academy's Executive Fire Officer Program. The focus of my research is Apartment Building Pre-Incident Planning for the Midwest City, Oklahoma Fire Department.

The survey consists of five sections including:

1) Background Information
2) Pre-Incident Planning Program Information
3) Information Gathered During Pre-Incident Planning
4) Information Needed During Emergency Response
5) Best Practices for Depicting Pre-Incident Information

Please note that NFPA 1620, *Recommended Practice for Pre-Incident Planning*, 2003 ed. defines an Apartment Building as: "a building or portion thereof containing three or more dwelling units with independent cooking and bathroom facilities". Additionally, the same standard defines a pre-incident plan as a "document developed by gathering general and detailed data used by responding personnel to determine the resources and actions necessary to mitigate anticipated emergencies at a specific facility".

I appreciate your time in completing this survey. Please feel free to contact me should you have any questions.

Jarett Metheny
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Instructions

This is an anonymous survey and the data from individual participants will not be reported separately. Please answer all the following questions as honestly as possible. If any question does not apply, please leave blank. The survey should take 10-15 minutes to complete.

Background Information

What is the name of your department?

What municipality or fire protection area and state does your department serve?

How many fire stations does your department have?

____1-10 ____11-20
____21-30 ____31-more

What is the population served by your department?

____1-50,000 ____50,001 – 100,000
____100,001 – 200,000 ____200,001 – 300,000
____300,001 – 400,000 ____400,001 – 500,000
____500,001 – above

Pre-Incident Planning Program Information

Does your department conduct pre-incident planning?

____Yes ____No ____Unsure

If yes, is pre-incident planning a formal program?

____Yes ____No ____Unsure

Does your pre-incident planning program specifically address apartment buildings?

____Yes ____ No ____Unsure

How often are your pre-incident plans updated?

____Monthly ____Annually ____New Construction
____Never ____Other

Do you believe your department's pre-incident plans are valuable during the response to an emergency at an apartment building?

____ Yes ____No ____Unsure

What recommendations would you make to improve the effectiveness of your pre-incident plans specifically dealing with apartment buildings (optional)

Are pre-incident plans utilized for training activities?

____Yes ____No ____Unsure

Are pre-incident plans utilized for post-incident analysis?

____Yes ____No ____Unsure

Information Obtained During Pre-Incident Planning

In your department, who is responsible for gathering pre-incident information at apartment buildings? Please select all that apply.

____Fire/EMS Companies
____Apartment Management
____Building Department Representatives
____Private Consultants
____Fire Protection Engineers
____District/Chief Officers
____Fire Prevention Officers
____Does Not Apply

Which of the following is gathered/reviewed during the pre-incident planning process of apartment buildings?

____Access Restrictions
____Aerial Device Considerations
____Building Unit Numbers
____Construction Class
____Emergency Contacts
____Exposures
____FD Connections
____Fire Wall Locations
____Ground View Photos
____Knox Box Location
____Surrounding Streets
____Name of Complex
____Number of Occupants
____Occupancy
____Plot Plan
____Rescue Concerns
____Security Gate Information
____Utility Locations
____Other
____Address
____Aerial View Photos
____Comments
____Dumpster Locations
____Environmental Impact
____Fence Locations
____Fire Protection Features
____First Due Considerations
____HazMat Location
____Length/Width/Height
____Mutual Aid Resource Needs
____Needed Fire Flow
____Number of Stories
____Parking Arrangements
____Pre-Determined Staging
____Roof Construction Features
____Special Hazards
____Water/Hydrant Locations

Information Needed During Emergency Response

In your department, who is responsible for maintaining, updating, and/or reviewing apartment building pre-incident plans? Please select all that apply.

____Fire/EMS Companies
____Apartment Management
____Building Department Representatives
____Private Consultants
____Fire Protection Engineers
____District/Chief Officers
____Fire Prevention Officers
____Does Not Apply

Which of the following information do you feel is most valuable for a company officer to have quick access to during the response phase of a fire involving an apartment building?

____Access Restrictions
____Aerial Device Considerations
____Building Unit Numbers
____Construction Class
____Emergency Contacts
____Exposures
____FD Connections
____Fire Wall Locations
____Ground View Photos
____Knox Box Location
____Surrounding Streets
____Name of Complex
____Number of Occupants
____Occupancy
____Plot Plan
____Rescue Concerns
____Security Gate Information
____Utility Locations
____Other
____Address
____Aerial View Photos
____Comments
____Dumpster Locations
____Environmental Impact
____Fence Locations
____Fire Protection Features
____First Due Considerations
____HazMat Location
____Length/Width/Height
____Mutual Aid Resource Needs
____Needed Fire Flow
____Number of Stories
____Parking Arrangements
____Pre-Determined Staging
____Roof Construction Features
____Special Hazards
____Water/Hydrant Locations

Depicting Information

In your department, who is responsible for developing pre-incident plans? Please check all that apply?

____Fire/EMS Companies
____Apartment Management
____Building Department Representatives
____Private Consultants
____Fire Protection Engineers
____District/Chief Officers
____Fire Prevention Officers
____Does Not Apply

What is the recommended method of depicting important information on a form that is used during emergency response? Please check all that apply.

____Standard paper size in a three-ring binder
____Hand-drawn
____Computer generated
____Other
____Mobile data computer
____Lager format that is laminated
____Standard format

Appendix B

Background Information Survey Results

Table B1

How many fire stations does your department have?

	Response Percent	Response Count
1 – 10	76.6%	128
11 – 20	8.4%	14
21 – 30	4.8%	8
31 – more	10.2%	17
	answered question	**167**
	skipped question	**0**

Table B2

What is the population served by your department?

	Response Percent	Response Count
1 – 50,000	37.7%	63
50,001 – 100,000	28.1%	47
100,001 – 200,000	12.6%	21
200,001 – 300,000	8.4%	14
300,001 – 400,000	0.0%	0
400,001 – 500,000	2.4%	4
500,001 – above	10.8%	18
	answered question	**167**
	skipped question	**0**

Appendix C

Pre-Incident Planning Program Information from Survey Respondents

Table C1

Does your department conduct pre-incident planning?

	Response Percent	Response Count
Yes	95.8%	158
No	4.2%	7
Unsure	0.0%	0
	answered question	**165**
	skipped question	**2**

Table C2

If yes, is pre-incident planning a formal program?

	Response Percent	Response Count
Yes	68.7%	112
No	30.7%	50
Unsure	.6%	1
	answered question	**163**
	skipped question	**4**

Table C3

Does your pre-incident planning program specifically address apartment buildings?

	Response Percent	Response Count
Yes	53.1%	86
No	44.4%	72
Unsure	2.5%	4
	answered question	**162**
	skipped question	**5**

Table C4

How often are your pre-incident plans updated?

	Response Percent	Response Count
Monthly	1.8%	3
Annually	40.5%	66
Only New Construction	11.7%	19
Never	8.6%	14
Other (please specify)	37.4%	61
	answered question	**163**
	skipped question	**4**

Table C5

Do you believe your department's pre-incident plans are valuable during the response to an emergency at an apartment building?

	Response Percent	Response Count
Yes	78.3%	126
No	12.4%	20
Unsure	9.3%	15
	answered question	**161**
	skipped question	**6**

Table C6

Are your department pre-incident plans utilized for training activities ?

	Response Percent	Response Count
Yes	67.9%	110
No	26.5%	43
Unsure	5.6%	9
	answered question	**162**
	skipped question	**5**

Table C7

Are your departments pre-incident plans used for post-incident analysis?

	Response Percent	Response Count
Yes	56.8%	92
No	34.6%	56
Unsure	8.6%	14
	answered question	**162**
	skipped question	**5**

Appendix D

Information Obtained During Pre-Incident Planning Survey Results

Table D1

In your department, who is responsible for gathering pre-incident information at apartment buildings? Please select all that apply.

	Response Percent	Response Count
Fire/EMS Companies	79.6%	125
District/Chief Officers	17.2%	27
Fire Prevention Officers	42.0%	66
Fire Protection Engineers	3.8%	6
Building Department Representatives	5.1%	8
Private Consultants	0.6%	1
Apartment Management	6.4%	10
Does Not Apply	8.9%	14
Other (please specify)	6.4%	10
	answered question	**157**
	skipped question	**10**

Table D2

Which of following is gathered/reviewed during the pre-incident planning process of apartment buildings?

	Response Percent	Response Count
Address	96.4%	135
Fire Department Connection Locations	93.6%	131
Water Supply / Hydrant Locations	92.1%	129
Number of Stories	90.7%	127
Emergency Contacts	87.1%	122
Fire Protection Features	85.7%	120
Access Restrictions	84.3%	118
Name of Complex	84.3%	118
Building Unit Numbers	83.6%	117
Knox Box Location	79.3%	111
Utility Shutoff Locations	76.4%	107
Construction Classification	75.7%	106
Length/Width/Height	73.6%	103
Occupancy Classification	73.6%	103
Exposure Concerns	69.3%	97
Special Hazards	69.3%	97
Plot Plan	67.9%	95
Roof Construction Features	66.4%	93
HazMat Information	61.4%	86

Comments	55.0%	77
Security Gate Information	55.0%	77
Map of Surrounding Streets	53.6%	75
Needed Fire Flow	47.9%	67
Fire Wall Locations	47.1%	66
Aerial Device Considerations	46.4%	65
Fence Locations	45.7%	64
Number of Occupants	36.4%	51
Rescue Concerns	35.0%	49
Aerial View Photos	33.6%	47
Parking Arrangements	33.6%	47
First Due Assignments	32.1%	45
Hose Lay Considerations	29.3%	41
Dumpster /Trash Bin Locations	23.6%	33
Ground View Photos	22.9%	32
Mutual Aid Resource Needs	15.7%	22
Pre-Determined Staging	12.1%	17
Environmental Impact Considerations	7.9%	11
Other (Please Specify)		10
	answered question	**140**
	skipped question	**27**

Appendix E

Information Needed During Emergency Response Survey Results

Table E1

In your department, who is responsible for maintaining, updating, and/or reviewing apartment building pre-incident plans? Please select all that apply.

	Response Percent	Response Count
Fire/EMS Companies	66.9%	101
District/Chief Officers	25.2%	38
Fire Prevention Officers	32.5%	49
Fire Protection Engineers	1.3%	2
Building Department Representatives	0.7%	1
Private Consultants	0.0%	0
Apartment Management	0.7%	1
Does Not Apply	11.9%	18
Other (please specify)	11.3%	17
	answered question	**151**
	skipped question	**16**

Table E2

Which of following information do you feel is most valuable for a company officer to have quick access to during the response phase of a fire involving an apartment building? Please select all that apply.

	Response Percent	Response Count
Water Supply / Hydrant Locations	88.9%	128
Fire Department Connection Locations	87.5%	126
Access Restrictions	72.2%	104
Number of Stories	70.8%	102
Fire Protection Features	66.0%	95
Utility Shutoff Locations	65.3%	94
Exposure Concerns	63.9%	92
Building Unit Numbers	63.2%	91
Address	60.4%	87
Knox Box Location	56.9%	82
Special Hazards	54.9%	79
Roof Construction Features	54.2%	78
Occupancy Classification	53.5%	77
Rescue Concerns	53.5%	77
Construction Classification	48.6%	70
Plot Plan	48.6%	70
Fire Wall Locations	47.9%	69
Security Gate Information	45.8%	66

Length/Width/Height	44.4%	64
Number of Occupants	43.8%	63
HazMat Information	42.2%	61
Map of Surrounding Streets	41.7%	60
Needed Fire Flow	41.7%	60
Emergency Contacts	39.6%	57
Aerial Device Considerations	39.6%	57
Name of Complex	37.5%	54
Hose Lay Considerations	31.3%	45
First Due Assignment	29.2%	42
Fence Locations	26.4%	38
Comments	23.6%	34
Aerial View Photos	20.8%	30
Pre-Determined Staging	20.1%	29
Ground View Photos	17.4%	25
Parking Arrangements	17.4%	25
Mutual Aid Resource Needs	14.6%	21
Dumpster /Trash Bin Locations	10.4%	15
Environmental Impact Considerations	8.3%	12
Other (Please Specify)	4.2%	6
	answered question	**144**
	skipped question	**23**

Appendix F

Depicting Information Survey Results

Table F1

In your department, who is responsible for developing pre-incident plans? Please select all that apply.

	Response Percent	Response Count
Fire/EMS Companies	78.8%	123
District/Chief Officers	27.6%	43
Fire Prevention Officers	32.1%	50
Fire Protection Engineers	2.6%	4
Building Department Representatives	1.9%	3
Private Consultants	1.3%	2
Apartment Management	0.6%	1
Does Not Apply	3.8%	6
Other (please specify)	7.1%	11
	answered question	**156**
	skipped question	**11**

Table F2

What is the recommended method of depicting important information on a form that is used during emergency response? Please check all that apply.

	Response Percent	Response Count
Mobile Data Computer	64.1%	98
Standard Paper Size Stored in Three Ring Binder	51.6%	79
Computer Generated	32.7%	50
Consistent and Standard Format	8.5%	13
Hand Drawn	5.9%	9
Larger Format (laminated document)	4.6%	7
Other (please specify)	6.5%	1
	answered question	**153**
	skipped question	**14**

Appendix G

Midwest City Fire Department Apartment Building Pre-Incident Planning Program Proposal

MEMO

To: Randy Olsen, Fire Chief
From: Jarett Metheny, Company Officer
Date: October 30, 2009
Subject: Apartment Building Pre-Incident Planning Program Proposal

Please accept this memo and attached standard operating procedure as a proposal for an apartment building pre-incident planning program. As part of the requirements for the Executive Fire Officer Program and the National Fire Academy, I conducted an applied research project of this topic that resulted in this proposal.

The Midwest City Fire Department strives in preparing for emergency situations as resources are effectively and efficiently coordinated. Through this research, I have found that 19.7% of Midwest City's occupied housing are defined as apartment buildings and 17.6% of building fires have occurred at apartment complexes. Research showed significant hazards for firefighters and civilian of apartment buildings because of the density and demographics of tenets, building construction features, and lack of updated pre-incident plans for responding officers. The purpose of this research was to determine what are the components of a pre-incident planning program, what apartment building information should gathered during building surveys, what apartment building information should be available during the emergency phase, and what is the recommended method of depicting and retrieving this information. These questions were answered through an extensive literature review and national survey and form the basis for this proposal.

The first recommended step in this proposal is to purchase a computer-aided drawing program. It is also recommended that the Midwest City graphics department as in creating a form with the information that is included in this proposal that will be used by company officers in collecting apartment building data as well as an additional form that is used to draft the plot plan of the apartment building. Research has also indicated the advantages of using the Mobile Data Computers to store and retrieve premise information and solutions to entering, storing and retrieving the data need to be resolved in conjunction with the 911 center.

Upon completion of the above, the 30 apartment buildings are assigned to the 18 companies with a training class on the purpose, procedures, and benefits of the program. This equates to each 6 companies being assigned 1 and 12 assigned 2 apartment buildings. It is recommended that 3 months being allowed for each crew to complete 1 pre-plan and additional 3 months for those assigned 2. Companies would use standardized forms to retrieve the data, enter into the computer program, review it with their shift commander, and submit it to the Fire Prevention Bureau for review and storage. The Fire Prevention Bureau would be responsible for coordinating the data entry into the mobile data computer system. Upon completion of all apartment buildings in six months, the shift training officers would coordinate a training class where the standard operating procedure is introduced, plans are distributed and training is conducted on the use of the plans.

It is recommended that each apartment building will have two pages of plans, one being a Quick Access Plan (QAP) form that contains critical information. The second page would be a plot plan that graphically depicts critical information needed for immediate decisions. In addition, the premise information from the on-board computers provides an additional source of information. The following page contains recommended information to be included in the pre-incident plans.

Once the information is gathered for apartment buildings, the proposed standard operating procedure takes effect which addresses the coordination of obtaining information on new buildings as well as an annual revision of existing plans.

The 2008 average response times for MWCFD when responding to buildings fires is 4 minutes and 43 seconds and critical decisions are made by multiple officers within this time frame. This proposal is submitted as a means of enhancing critical decision-making, provide for a valuable and practical training tool, tools for enhanced post-incident analysis, and increasing the safety of the citizens and visitors of Midwest City.

Please feel free to contact me should you have any questions or require any additional information.

Contents to be included on QAP	**Contents of Plot Plan**
Pre-Plan Number	Dimensions (area/width/height)
Revision Date	Surrounding Streets and Access
Name of Apartment Building	Symbol Legend and North
Response District	Exposures
Emergency Contact Information	Fire Wall Locations
Construction and Roof Type	Hydrants
Fire Protection Systems and Descriptions	Fire Department Connections
Location of Fire Department Connections	Utility Control Locations
Water Supply / Hydrant Locations	Pool Location with Chemicals
Number of Stories	Knox-Box Locations
Security Gate Considerations	Access Restrictions
Number of Living Units	Environmental Runoff Potential
Comments	Comments

Midwest City Fire Department
Standard Operating Procedure

Section: Incident Management
Article: Pre-Incident Planning
Subject: Apartment Buildings

Number: IMS-XXX
Date Initiated:
Date Revised:

Approved: _____ _____
Randy Olsen, Fire Chief **Date**

Intent
The intent of this Standard Operating Procedure is to communicate and define the pre-incident planning program for apartment buildings.

Applicable Standards, Regulations, and References
National Fire Protection Association. (2003.) *NFPA 1620: Recommended practice for pre-incident planning*. Quincy, MA

Attachments
Appendix A – Apartment Building Data Collection Form
Appendix B – Apartment Building Plot Plan Form

Policy
The Midwest City Fire Department establishes this Apartment Building Pre-Incident Planning Policy to enhance the safety of firefighters and promote the decision-making process for personnel responding to and mitigating emergencies at apartment buildings. It shall the policy of the Midwest City Fire Department to revise apartment building pre-incident plans on at least an annual basis, utilized pre-incident plans for training the through post-incident analysis.

I. Pre-Incident Planning for New or Renovated Buildings

A. A the Fire Prevention Bureau approves the building plans for a new apartment building, the Fire Marshal or appropriate Fire Inspector shall a digit and hard copy go the plot plan is received. Upon completion and approval of the plans review process, the Fire Marshal shall ensure the building is assigned to an emergency response company and coordinated with the Shift Commander.

B. The Company Officer shall be forwarded a hard copy of the plot plan that was provided and shall begin the pre-incident planning process during the construction phase of the building. The Company Officer that is assigned the plan shall coordinate with opposite shift Company Officers assigned to that station.

C. Upon completion of the building process, the Company Officer shall contact the Apartment Building Manager and schedule a time to complete the pre-incident plan using the forms found in Appendix A and B of this document.

D. The Company Officer shall complete the form and complete the computer generated plot plan of the of the building and review with their respective Shift Commander. The plan is then forwarded to the Fire Marshal for review and approval. The final plan is stored in a secured network drive, information is entered in the Mobile Computer Terminal file, and copies for each response unit are made.

E. Each Shift Training Officer and Shift Commander shall be responsible for conducting a class on the apartment building using the pre-incident plan.

II. Pre-Incident Planning for Existing Apartment Buildings

A. The Fire Marshal shall assign an emergency response company a apartment building that is to be formally reviewed and updated.

B. The company officer is responsible for making contact with the apartment complex manager and scheduling a pre-incident planning update. They shall be responsible for completing the review, updating the information, reviewing with their shift commander, and submitting to the Fire Marshal before September 30 of each year.

C. The Fire Marshal shall ensure the changes and updates are appropriately made and updated copies are distributed to all companies.

D. Any notification of changes or renovations shall be immediately forward to the Fire Prevention Bureau who will then assign the pre-incident plan to a company for review and updating.

E. The Fire Marshal is responsible for communicating any change to a pre-incident plan through the Shift Commanders to all Company Officers.

III. Quarterly Training

A. During each quarter, each Company Officer is responsible for conducting a training session using the pre-incident plans as assigned by the Shift Training Officer. Shift Training Officers are responsible for documenting and coordinating the training schedule each shift is exposed to a different pre-incident plan each quarter.

IV. Post-Incident Analysis

A. Following an emergency at an apartment building that requires multiple companies, the Shift Commander and Shift Training Officer are responsible for conducting a post-incident analysis that includes the entire shift.

B. Any changes or modifications to the pre-incident plan that are needed following the post-incident analysis shall be reported to the Fire Marshal, who shall be responsible for making the changes and updating all personnel.